

1 1. A capillary array electrophoresis plate, comprising:
2 an array of separation channels formed on said plate; and
3 an array of sample reservoirs formed on said plate and
4 coupled to said separation channels.

1 2. The plate of claim 1, wherein said array of sample
2 reservoirs are organized into one or more sample injectors.

3 3. The plate of claim 2, further comprising a waste
4 reservoir positioned in each sample injector.

5 4. The plate of claim 3, wherein one of said waste
6 reservoirs is coupled to one or more sample reservoirs in each
7 sample injector.

8 5. The plate of claim 1, further comprising a cathode
9 reservoir, said cathode reservoir being connected to one or more
10 separation channels.

11 6. The plate of claim 1, further comprising an anode
12 reservoir common to one or more separation channels.

13 7. The plate of claim 1, wherein the plate has one set of
14 reservoirs positioned near an outer perimeter, and one set of
15 reservoirs positioned near a center and the separation channels
16 connect the reservoirs near the outer perimeter to reservoirs

1 near the center.

1 8. The plate of claim 7, wherein the separation channels
2 radially connect the outer perimeter to the center.

1 9. The plate of claim 1, further comprising an electrode
2 array coupleable to said reservoir array.

1 10. The plate of claim 9, further comprising a reservoir
array layer having an array of openings coupleable to said
reservoir array.

1 11. The plate of claim 1, wherein said reservoir array is
regularly spaced in one or two dimensions on said plate and
adapted to engage a multi-headed pipetter.

1 12. A capillary array electrophoresis plate, comprising:
2 a plurality of separation channels formed at a surface of
3 said plate;

4 one or more anode reservoirs formed at a surface of said
5 plate; and

6 one or more injectors formed at a surface of said plate,
7 said injector having:

8 a plurality of sample reservoirs formed on said plate
9 and coupled to said separation channels;

10 a plurality of waste reservoirs formed on said plate

1 and coupled to said separation channels; and

2 at least one cathode reservoir multiplexed with a
3 plurality of said separation channels.

1 13. The plate of claim 12, further comprising an electrode
array coupleable to said reservoirs.

1 14. The plate of claim 12, wherein the plate has an outer
2 perimeter and a center and the separation channels connect the
3 outer perimeter to the center.

10 15. A capillary array electrophoresis plate comprising:

11 an array of microfabricated separation channels formed at a
12 surface of a first microfabricated substrate and a corresponding
13 surface of a second substrate bonded to said first and second
14 substrates, each of said channels having first and second ends;

15 an array of sample reservoirs formed at a surface of said
16 plate;

17 an array of waste reservoirs formed at a surface of said
18 plate;

19 an array of cathode reservoirs coupled to the first end of
20 each of the separation channels;

21 an array of anode reservoirs coupled to the second end of
22 each of the separation channels; and

23 an injector formed by an injection channel connected to one
24 or more sample reservoirs that crosses a separation channel and

10 connects to a waste reservoir.

1 16. The capillary array electrophoresis plate of claim 15,
2 wherein both substrates are microfabricated.

1 17. The capillary array electrophoresis plate of claim 15,
2 wherein the substrates are made of glass.

1 18. The capillary array electrophoresis plate of claim 15,
2 wherein the substrates are made of plastic.

1 19. The capillary array electrophoresis plate of claim 15,
2 wherein one or more separation channels are connected to a common
3 cathode reservoir.

1 20. The capillary array electrophoresis plate of claim 15,
2 wherein one or more separation channels are connected to a common
3 waste reservoir.

1 21. The capillary array electrophoresis plate of claim 15,
2 wherein one or more separation channels are connected to a common
3 anode reservoir.

1 22. The capillary array electrophoresis plate of claim 15,
2 wherein one or more sample reservoirs are connected to one
3 separation channel and one or more waste reservoirs.

1. 23. The capillary array electrophoresis plate of claim 15,
2 further comprising a reservoir array layer mounted above the
3 plate, the reservoir array layer having openings positioned to
4 couple to the sample reservoirs, the waste reservoirs, the
5 cathode reservoirs, and the anode reservoirs.
6

7 24. The plate of claim 15, further comprising an electrode
8 array coupleable to said reservoir array layer.

3 25. The capillary array electrophoresis plate of claim 15,
4 wherein the first substrate has an array of electrodes aligned
5 with the sample reservoirs, the waste reservoirs, the cathode
6 reservoirs, and the anode reservoirs to make electrical contacts
7 with the solutions in the reservoirs.

1 26. The capillary array electrophoresis plate of claim 24
2 wherein said electrode array is integral with the two substrates.

1 27. The capillary array electrophoresis plate of claim 26,
2 wherein the sample reservoirs are regularly spaced on the plate
3 to receive solutions from a multi-headed pipetter system.

1 28. The capillary array electrophoresis plate of claim 15,
2 wherein the plate has H holes, and wherein H is approximately
3 equal to $5N/4$, with N being the number of samples to be

1 processed.

1 29. The capillary array electrophoresis plate of claim 15,
2 wherein the distance from each cathode reservoir to a
3 corresponding injector is approximately equal and where the
4 distance from each injector to its corresponding anode reservoir
5 for each separation channel is approximately equal.

30. The capillary array electrophoresis plate of claim 15,
wherein the plate is made of glass or plastic.

31. A method of forming a capillary array electrophoresis
plate, comprising:

forming an array of microfabricated separation channels at a
surface of the plate;

forming an array of microfabricated sample reservoirs at a
surface of the plate; and

connecting the array of microfabricated sample reservoirs to
the array of microfabricated separation channels.

32. The method of claim 31, further comprising grouping the
array of sample reservoirs into one or more injectors.

33. The method of claim 32, further comprising forming a
waste reservoir in each sample injector.

1 34. The method of claim 33, further comprising multiplexing
2 a cathode reservoir with the sample reservoirs.

1 35. The method of claim 34, further comprising multiplexing
2 an anode reservoir to all sample reservoirs on the plate, wherein
3 a distance from each cathode reservoir to a corresponding
4 injector is approximately equal and where the distance from each
5 injector to its corresponding anode reservoir for each separation
6 channel is approximately equal.

1 36. A method for injecting a sample through a capillary
2 array electrophoresis plate with microfabricated separation
3 channels connected to sample reservoirs, waste reservoirs,
4 cathode reservoirs, and anode reservoirs, the method comprising:

5 applying an injection voltage between a first reservoir and
6 a waste reservoir to draw the sample into a cross channel region
7 while applying a bias voltage to the cathode and anode reservoirs
8 to control injection plug width;

9 applying a running voltage between the cathode and anode
10 reservoirs; and

11 applying a biasing voltage to the waste and injector
12 reservoirs to pull away residuals of the sample.

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C2